CTEH CENTER FOR TOXICOLOGY AND ENVIRONMENTAL HEALTH,LLC

Mission Incident
Santa Paula, CA
Preliminary Summary of Air Monitoring Results
December 05, 2014

Prepared by
Center for Toxicology and Environmental Health, L.L.C. (CTEH®)
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CTEH CENTER FOR TOXICOLOGY AND ENVIRONMENTAL HEALTH,LLC

Introduction

Center for Toxicology and Environmental Health, LLC (CTEH®) continued air monitoring in support of response activities following a vac truck explosion and fire in Santa Paula, CA.

This submittal summarizes air monitoring data for December 05, 2014 07:00 to December 06, 2014 07:00.

Real-time Air Monitoring

All instrumentation was calibrated at least once per day or per manufacturer's recommendations. Manually-logged real-time air monitoring was conducted for chlorine (Cl_2), hydrogen sulfide (H_2S), percent of the Lower Explosive Limit (LEL), oxygen (O_2), peroxides, particulate matter (10 micron particles, PM_{10}), sulfur dioxide (SO_2), sulfuric acid (H_2SO_4), and volatile organic compounds (VOCs), with instruments such as Gastec® pumps with chemical-specific colorimetric tubes, RAESystems® MultiRAE Plus and MultiRAE Pro PID with chemical-specific sensors, and TSI® AM510s for particulate matter. Monitoring was conducted by CTEH® personnel in the work area, at fixed locations in the surrounding community, and along the perimeter of the facility in the community. Table 1 summarizes monitoring data for manually-logged real-time readings. Maps including the site location, fixed community real-time air monitoring locations, aerial site photo, and roaming monitoring are included in Appendix A.

CTEH® monitored RAESystems© AreaRAE units with ProRAE Guardian system at four locations on the fence line of the facility within the work area and an additional three units throughout the day by frac tanks near the designated decon areas. AreaRAEs were equipped with sensors to detect VOCs, LEL, H_2S, and SO_2. Table 2 summarizes monitoring data for AreaRAE monitoring. AreaRAE graphs displaying real-time air monitoring data as well as 15-minute rolling averages and a map depicting AreaRAE locations are included in Appendix B.

Particulate monitors were data-logged along the facility perimeter collocated with AreaRAE stations 1, 2, 3, and 4. Table 3 summarizes data-logged PM_{10} data from these units.

Table 1: Manually-Logged Real-Time Air Monitoring Summary[1]
December 05, 2014 07:00 – December 06, 2014 07:00

Location Category	Analyte	Instrument	No. of Readings	No. of Detections	Avg. of Detections	Concentration Range
Community	Cl_2	Gastec 8La	6	0	NA	<0.05 ppm
	H_2S	MR+ / MR Pro	27	0	NA	<0.1 ppm
	HCl	Gastec 14L	6	0	NA	<0.05 ppm
	LEL	MR+ / MR Pro	27	0	NA	<1 %
	O_2	MR+ / MR Pro	27	27	20.9	20.9 - 20.9 %
	Peroxides	Gastec 32	13	0	NA	<0.1 ppm
	PM_{10}	AM510/Dusttrak	26	26	0.027	0.017 - 0.045 mg/m^3
	SO_2	MR+ / MR Pro	27	0	NA	<0.1 ppm
	H_2SO_4	Gastec 35	13	0	NA	<0.2 mg/m3
	VOC	MR+ / MR Pro	27	0	NA	<0.1 ppm
Exclusion Zone	Cl_2	Gastec 8La	2	0	NA	<0.05 ppm
	H_2S	MR+ / MR Pro	5	0	NA	<0.1 ppm
	HCl	Gastec 14L	2	0	NA	<0.05 ppm
	LEL	MR+ / MR Pro	5	0	NA	<1 %
	O_2	MR+ / MR Pro	5	5	20.9	20.9 - 20.9 %
	Peroxides	Gastec 32	2	0	NA	<0.1 ppm
	PM_{10}	AM510/Dusttrak	5	5	0.022	0.014 - 0.026 mg/m^3
	SO_2	MR+ / MR Pro	5	0	NA	<0.1 ppm
	H_2SO_4	Gastec 35	2	0	NA	<0.2 mg/m3
	VOC	MR+ / MR Pro	5	0	NA	<0.1 ppm
Work Area	Cl_2	Gastec 8La	5	0	NA	<0.05 ppm
	H_2S	Gastec 4LL	3	0	NA	<0.1 ppm
	H_2S	MR+ / MR Pro	28	0	NA	<0.1 ppm
	HCl	Gastec 14L	1	0	NA	<0.05 ppm
	LEL	MR+ / MR Pro	29	0	NA	<1 %
	O_2	MR+ / MR Pro	16	16	20.9	20.9 - 20.9 %
	Peroxides	Gastec 32	4	0	NA	<0.1 ppm
	PM_{10}	AM510/Dusttrak	8	8	0.015	0.002 - 0.028 mg/m^3
	SO_2	MR+ / MR Pro	29	0	NA	<0.1 ppm
	H_2SO_4	Gastec 35	1	0	NA	<0.2 mg/m3
	VOC	MR+ / MR Pro	28	0	NA	<0.1 ppm

[1]*Note: The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format.*
[2]*Maximum detections preceded by the "<" symbol are considered non-detects below reporting limit to the right.*

Table 2: AreaRAE Air Monitoring Summary[1]
December 04, 2014, 2014 07:00 – December 05, 2014 07:00

Unit ID	Analyte	No. of Readings	No. of Detections	Avg. of Detections	Detection Range
Unit 01	H_2S	5586	0	NA	< 1 ppm
	LEL	5586	0	NA	< 1 %
	SO_2	5586	0	NA	< 0.1 ppm
	VOC	5586	0	NA	< 0.1 ppm
Unit 02	H_2S	5587	0	NA	< 1 ppm
	LEL	5587	0	NA	< 1 %
	SO_2	5587	0	NA	< 0.1 ppm
	VOC	5587	1	0.1 ppm	0.1 - 0.1 ppm
Unit 03	H_2S	5589	0	NA	< 1 ppm
	LEL	5589	0	NA	< 1 %
	SO_2	5589	0	NA	< 0.1 ppm
	VOC	5589	0	NA	< 0.1 ppm
Unit 04	H_2S	5099	0	NA	< 1 ppm
	LEL	5099	0	NA	< 1 %
	SO_2	5099	0	NA	< 0.1 ppm
	VOC	5099	0	NA	< 0.1 ppm
Unit 06	H_2S	1534	61	0.1 ppm	0.1 - 0.1 ppm
	LEL	1534	0	NA	< 1 %
	SO_2	1534	1	0.1 ppm	0.1 - 0.1 ppm
	VOC	1534	123	0.1 ppm	0.1 - 0.2 ppm
Unit 07	H_2S	1619	7	0.1 ppm	0.1 - 0.1 ppm
	LEL	1619	0	NA	< 1 %
	SO_2	1619	0	NA	< 0.1 ppm
	VOC	1619	1610	0.3 ppm	0.1 - 1.5 ppm
Unit 08	H_2S	395	137	0.2 ppm	0.1 - 0.4 ppm
	LEL	395	0	NA	< 1 %
	SO_2	395	0	NA	< 0.1 ppm
	VOC	395	0	NA	< 0.1 ppm

[1]*Note: The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format.*
[2]*Maximum detections preceded by the "<" symbol are considered non-detects below reporting limit to the right.*

Table 3: AM510 PM_{10} Monitoring Summary[1]
December 04, 2014, 2014 07:00 – December 05, 2014 07:00

Serial No.	Location	No. of Readings	No. of Detections	Avg. Detection	Detection Range
10704067	AR01	4220	4220	0.013	0.005 - 0.185 mg/m^3
10601072	AR02	4125	4125	0.015	0.005 - 0.212 mg/m^3
10704072	AR03	4130	4130	0.009	0.002 - 0.049 mg/m^3
10704074	AR04	3996	207	0.069	0.001 - 0.622 mg/m^3

Appendix A

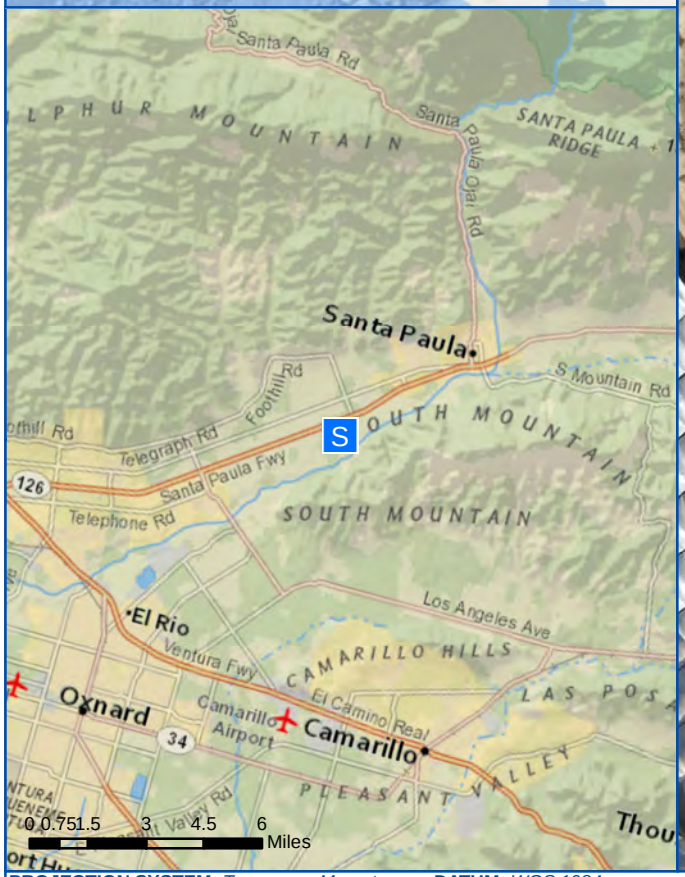
Incident Maps:

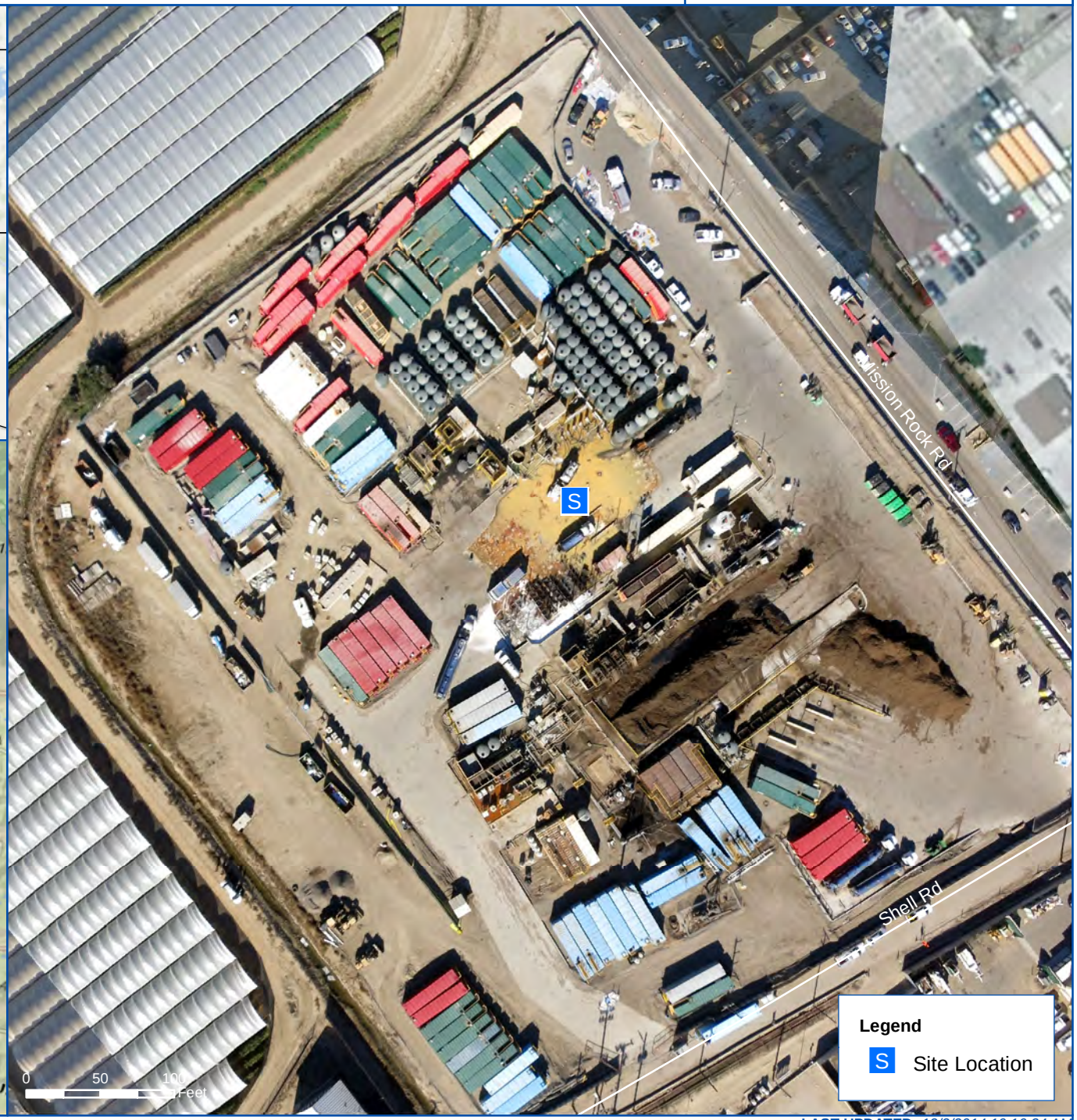
Real-time Air Monitoring Locations and Incident Site

Site Location

Mission Incident

Project: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura





PROJECTION SYSTEM: *Transverse Mercator* **DATUM:** *WGS 1984* **LAST UPDATED:** *12/2/2014 10:10:34 AM*

Aerial Overview - 12/05/2014

Mission Incident

Project: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *Transverse Mercator* **DATUM:** *WGS 1984* **LAST UPDATED:** *12/6/2014 9:56:23 AM*

Fixed Community Real-Time Air Monitoring Station Locations

Mission Incident

Project: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *Transverse Mercator* **DATUM:** *WGS 1984* **LAST UPDATED:** *11/25/2014 12:22:02 PM*

Manually Logged Real-Time Air Monitoring Concentrations

VOC - Dec 05, 2014 07:00 to Dec 06, 2014 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *UTM13N* COORDINATE SYSTEM: *WGS84*

Print Date: *12/6/2014 12:04:39 PM*

Manually Logged Real-Time Air Monitoring Concentrations

H_2SO_4 - Dec 05, 2014 07:00 to Dec 06, 2014 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *UTM13N* **COORDINATE SYSTEM:** *WGS84* **Print Date:** *12/6/2014 12:05:42 PM*

Manually Logged Real-Time Air Monitoring Concentrations

SO_2 - Dec 05, 2014 07:00 to Dec 06, 2014 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *UTM13N* **COORDINATE SYSTEM:** *WGS84*

Print Date: *12/6/2014 12:07:17 PM*

Manually Logged Real-Time Air Monitoring Concentrations

PM_{10} - Dec 05, 2014 07:00 to Dec 06, 2014 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *UTM13N* **COORDINATE SYSTEM:** *WGS84* **Print Date:** *12/6/2014 12:13:04 PM*

Manually Logged Real-Time Air Monitoring Concentrations

Peroxides - Dec 05, 2014 07:00 to Dec 06, 2014 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *UTM13N* COORDINATE SYSTEM: *WGS84*

Print Date: *12/6/2014 12:08:52 PM*

Manually Logged Real-Time Air Monitoring Concentrations

O_2 - Dec 05, 2014 07:00 to Dec 06, 2014 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *UTM13N* COORDINATE SYSTEM: *WGS84*

Print Date: *12/6/2014 12:09:29 PM*

Manually Logged Real-Time Air Monitoring Concentrations

LEL - Dec 05, 2014 07:00 to Dec 06, 2014 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *UTM13N* COORDINATE SYSTEM: *WGS84*

Print Date: *12/6/2014 12:09:58 PM*

Manually Logged Real-Time Air Monitoring Concentrations

HCl - Dec 05, 2014 07:00 to Dec 06, 2014 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *UTM13N* **COORDINATE SYSTEM:** *WGS84*

Print Date: *12/6/2014 12:11:17 PM*

Manually Logged Real-Time Air Monitoring Concentrations

H_2S - Dec 05, 2014 07:00 to Dec 06, 2014 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *UTM13N* COORDINATE SYSTEM: *WGS84*

Print Date: *12/6/2014 12:11:49 PM*

Manually Logged Real-Time Air Monitoring Concentrations

Cl_2 - Dec 05, 2014 07:00 to Dec 06, 2014 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *UTM13N* **COORDINATE SYSTEM:** *WGS84* **Print Date:** *12/6/2014 12:06:31 PM*

Appendix B:

AreaRAE Trend Graphs, AM510 Trend Graphs, and AreaRAE/AM510 Air Monitoring Location Map

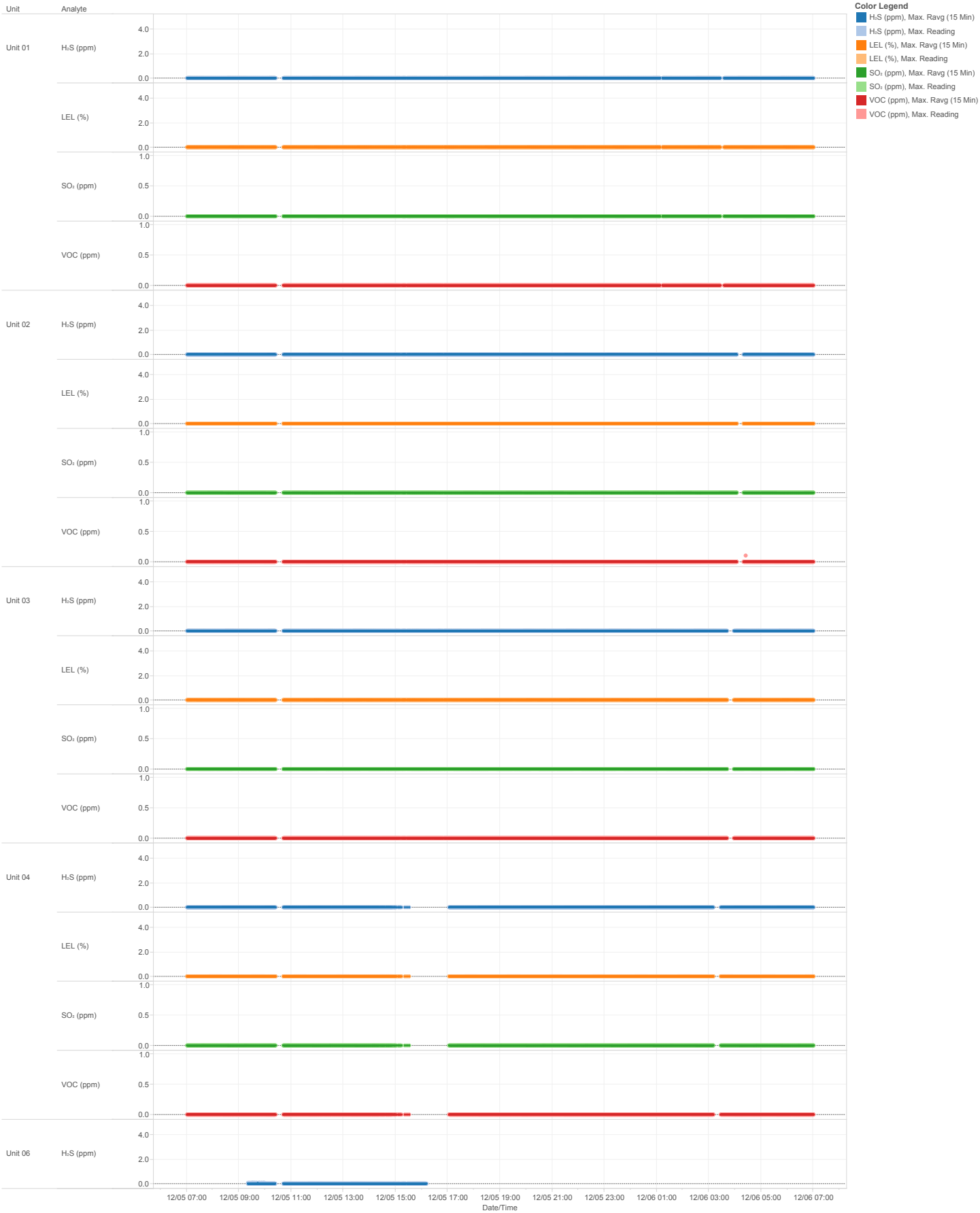
AreaRAE and AM510 Locations

Mission Incident

Project: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *Transverse Mercator* **DATUM:** *WGS 1984* **LAST UPDATED:** *12/6/2014 6:21:50 PM*

Patriot Environmental
AreaRAE Trend Graphs
12/05/2014 07:00 - 12/06/2014 07:00

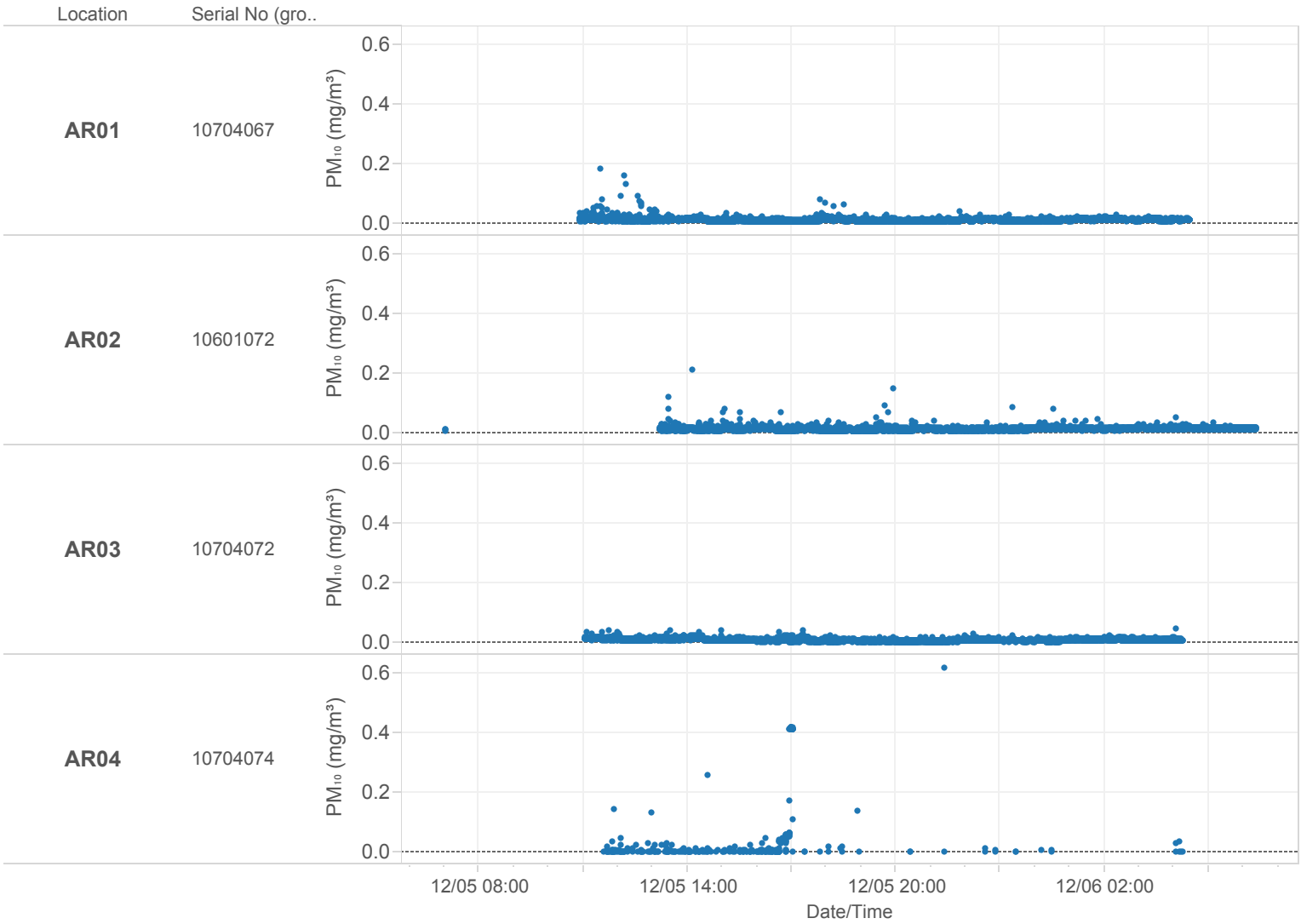


- The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format
- AreaRAE data may contain "drift events." Drift is defined as interference in the electrochemical sensor's ability to accurately report the concentration of a chemical in the atmosphere, resulting in "false positives"

Patriot Environmental
AreaRAE Trend Graphs
12/05/2014 07:00 - 12/06/2014 07:00

- The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format
- AreaRAE data may contain "drift events." Drift is defined as interference in the electrochemical sensor's ability to accurately report the concentration of a chemical in the atmosphere, resulting in "false positives"

Patriot Environmental
MISSION INCIDENT
Datalogged AM510 (PM_{10}) Summary
12/05/2014 07:00 - 12/06/2014 07:00



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